## REMARKS

Claims 1, 2 and 7-26 are pending in the application. Claims 3-6 were previously cancelled. Claims 15-26 were previously added.

Claim 8 is rejected under 35 U.S.C. 112. Claim 8 is amended to overcome this rejection.

Claims 1, 2 and 7-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,481,629 to Tabuchi, hereinafter "Tabuchi", in view of U.S. Patent No. 5,930,429 to Trott, hereinafter "Trott". Claims 1 and 15 are independent. Applicants respectfully traverse this rejection.

The Office Action also mentions U.S. Patent No. 6,157,759 to Seo et al., hereinafter "Seo", however Seo is not explicitly described as a grounds for rejection. Nonetheless, Applicants will address Seo in the context of the 103 rejection.

Independent claim 1 provides a mounting arrangement for at least one optical component in a planar lightwave circuit. The arrangement includes a substrate, an input optical fiber associated with the substrate, and an output optical waveguide in a given set of planar layers of the substrate, where the at least one optical component is mountable on the substrate to transmit optical radiation from the input optical fiber to the output optical waveguide. The arrangement further includes a length of optical waveguide on the substrate in the same planar layers of the output optical waveguide. The length of optical waveguide is interposed between the input optical fiber and the at least one optical component so that the at least one optical component is interposed between the length of optical waveguide and the output optical waveguide.

Tabuchi discloses an integrated optical device having a silicon substrate, a planar optical waveguide formed partially on the surface of the silicon substrate, a V groove having a V-shaped cross section for position-aligning an optical fiber so as to

optically couple the planar optical waveguide and the optical fiber, an edge input/output type optical semiconductor device bonded on the top surface of a bonding pedestal, and optical axis level changing means for optically coupling the optical waveguide and the optical semiconductor device (col. 3, lines 40-67).

Optical waveguides 20 are formed partially on the surface of a silicon substrate 1 (col. 6, lines 18-19). A V groove 5 is formed on the surface of the silicon substrate, extending in one direction along the optical axis from the a first end of the waveguide 20 which corresponds to a light input/output port (col. 6, lines 27-30). An optical fiber 9 is fitted in, and fixed to, the V groove 5, which provides position alignment between the optical fiber 9 and the optical waveguide 20 (col. 6, lines 30-32).

The active region of the optical semiconductor device 8 is at a position higher than a core region 4 of waveguide 20 (col. 6, lines 41-42). Spherical lenses 10 and 11, and optical member 12, are provided to displace the optical axis by an amount equal to a difference between the heights (col. 6, lines 42-47).

Tabuchi discloses an optical fiber optically coupled to a planar waveguide, which is coupled to a semiconductor device via optical components. The semiconductor device is higher than the optical fiber and planar waveguide, and thus optical components are required to couple radiation from the semiconductor device to the planar waveguide. In contrast, claim 1 provides that the length of optical waveguide is on a substrate **in the same planar layers of the output optical waveguide**. Tabuchi does not disclose an output optical waveguide as recited in claim 1.

Furthermore, in all of the embodiments disclosed in Tabuchi, the semiconductor device is a semiconductor laser, which emits optical radiation. Radiation is coupled from the semiconductor laser to the optical fiber. Therefore, the optical fiber described in the embodiments of Tabuchi is an **output optical fiber**. In contrast, claim 1 provides a waveguide disposed between an **input optical fiber** and an optical component.

Therefore, Tabuchi does not disclose or suggest "a length of optical waveguide on said substrate in the same planar layers of said output optical waveguide, said length of optical waveguide being interposed between said input optical fiber and said at least one optical component so that said at least one optical component is interposed between said length of optical waveguide and said output optical waveguide," as recited in claim 1.

In addition, Tabuchi does not disclose or suggest an additional length of optical fiber positioned between the optical semiconductor device and the optical fiber. Thus, Tabuchi does not disclose or suggest "a length of optical fiber associated to said substrate between said at least one optical component and said output optical waveguide so that said at least one optical component is interposed between said input optical fiber and said length of optical fiber," as recited in claim 15.

Trott is cited by the Office Action, on page 4, for teaching the use of lenses and photodetectors for focusing light. Trott discloses photonics modules having edge-emitting semiconductor lasers for transmitting, and photodetectors for receiving, light through optical fibers (col. 1, lines 35-38). A lens may be placed between a laser and an optical fiber, and may also be placed between the fiber output and a surface-detecting photodetector (col. 1, lines 41-48). Other optical components such as isolators may also be inserted between the edge-emitting laser and the optical fiber (col. 1, lines 52-54).

Seo discloses an optical fiber passive alignment apparatus for coupling an optical waveguide and an optical fiber, and a method for producing the apparatus (col. 3, lines 58-61). In the method, an optical fiber is mounted in a V-groove of an optical waveguide, and the optical fiber and the optical waveguide are simultaneously vertically sliced (col. 3, lines 62-65). A dicing blade makes a cavity into which a material having a refractive index that increases on irradiation with UV rays is injected (col. 4, lines 7-11). UV rays are then supplied through the optical fiber, so that the portion of the material struck by UV rays is cured, and the refractive index of the cured portion increases more

than the non-cured portion, thereby resulting in an optical waveguide whose core flares out (col. 4, lines 19-23).

According to the Office Action, Trott teaches that a lens may be inserted between a laser source and an optical fiber, and between the optical fiber and an output (photodetector). Trott simply discloses that a lens such as a ball lens may be inserted between the laser and an output (col. 8, lines 5-20). However, Trott does not disclose or suggest that a separate section of a waveguide be placed between an optical fiber and an output. Additionally, although Trott may teach including a lens between an optical fiber and an output, there is no disclosure or suggestion of including **either a waveguide or a length of optical fiber, in addition to a lens, between the optical fiber and output**.

Likewise, Seo merely discloses a waveguide positioned between an input/output waveguide ("I/O waveguide") and an optical fiber, for coupling radiation between the optical fiber and the input/output waveguide. Seo does not disclose or suggest **any additional components between the I/O waveguide and the optical fiber**. Indeed, Seo teaches that the waveguide is created by injecting material in a cavity between the I/O waveguide and the optical fiber. The injected material fills the cavity (see col. 2, lines 15-20). As a result, there is no space between the I/O waveguide and the optical fiber. This configuration disclosed in Seo precludes incorporating the waveguide with additional components.

Therefore, Trott and Seo, whether considered alone or in combination, do not disclose or suggest "a length of optical waveguide on said substrate in the same planar layers of said output optical waveguide, said length of optical waveguide being interposed between said input optical fiber and said at least one optical component so that said at least one optical component is interposed between said length of optical waveguide and said output optical waveguide," as recited in claim 1.

In addition, Trott and Seo, whether considered alone or in combination, do not disclose or suggest "a length of optical fiber associated to said substrate between said at least one optical component and said output optical waveguide so that said at least one optical component is interposed between said input optical fiber and said length of optical fiber," as recited in claim 15.

Also, there is no motivation to combine the teachings of Tabuchi or Trott with the teachings of Seo. As discussed above, Seo discloses a waveguide created **without any remaining space** between the I/O waveguide and the optical fiber. Tabuchi and Trott both include multiple components positioned between a radiation source and an optical fiber or waveguide. Neither Tabuchi nor Trott suggest that additional waveguides would provide any benefit in coupling radiation between a radiation source and an optical fiber/waveguide. Because Seo teaches creating a single waveguide only between an I/O waveguide and an optical fiber, one skilled in the art would not look to Seo as motivation to include additional components in the devices of Tabuchi and Trott.

For the reasons discussed above, Tabuchi, Trott and Seo do not disclose or suggest the elements of either claim 1 or claim 15. Also for the reasons discussed above, there is no motivation to combine the teachings of Tabuchi, Trott and Seo. Therefore, claims 1 and 15 are patentable over the cited combination of Tabuchi, Trott and Seo.

Claims 2 and 7-14 depend from claim 1, and claims 16-26 depend from claim 15. For at least reasoning similar to that provided in support of claims 1 and 15, claims 2, 7-14 and 16-26 are also patentable over the cited combination of Tabuchi, Trott and Seo.

For the reasons set forth above, it is submitted that the rejection of claims 1, 2 and 7-26 under 35 U.S.C. 103(a) as unpatentable over Tabuchi in view of Trott and Seo is overcome. Applicants respectfully request that the rejection of claims 1, 2 and 7-26 be reconsidered and withdrawn.

Claim 19 is rejected under 103(a) as being unpatentable over Tabuchi in view of Trott, and further in view of U.S. Patent No. 5,999,303 to Drake, hereinafter "Drake". Claim 19 depends from claim 15. Applicants respectfully traverse this rejection.

As discussed above, claim 15 is patentable over the cited combination of Tabuchi and Trott. Applicants do not believe that Drake makes up for the deficiencies of Tabuchi and Trott, as they apply to claim 15. Accordingly, Applicants submit that claim 15 is patentable over the cited combination of Tabuchi, Trott and Drake.

Claim 19 depends from claim 15. For at least reasoning similar to that provided in support of the patentability of claim 15, claim 19 is patentable over the cited combination of Tabuchi, Trott and Drake. Therefore, Applicants submit that the rejection of claim 19 as unpatentable over Tabuchi, Trott and Drake, and respectfully request that the rejection of claim 19 be reconsidered and withdrawn.

Claim 20 is rejected under 103(a) as being unpatentable over Tabuchi and Trott in view of U.S. Patent No. 5,787,214 to Harpin et al., hereinafter "Harpin". Claim 20 depends from claim 15. Applicants respectfully traverse this rejection.

As discussed above, claim 15 is patentable over the cited combination of Tabuchi and Trott. Applicants do not believe that Harpin makes up for the deficiencies of Tabuchi and Trott, as they apply to claim 15. Accordingly, Applicants submit that claim 15 is patentable over the cited combination of Tabuchi, Trott and Harpin.

Claim 19 depends from claim 15. For at least reasoning similar to that provided in support of the patentability of claim 15, claim 20 is patentable over the cited combination of Tabuchi, Trott and Harpin. Therefore, Applicants submit that the rejection of claim 20 as unpatentable over Tabuchi, Trott and Harpin, and respectfully request that the rejection of claim 20 be reconsidered and withdrawn.

An indication of the allowability of all pending claims by issuance of a Notice of Allowability is earnestly solicited.

Respectfully submitted,

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